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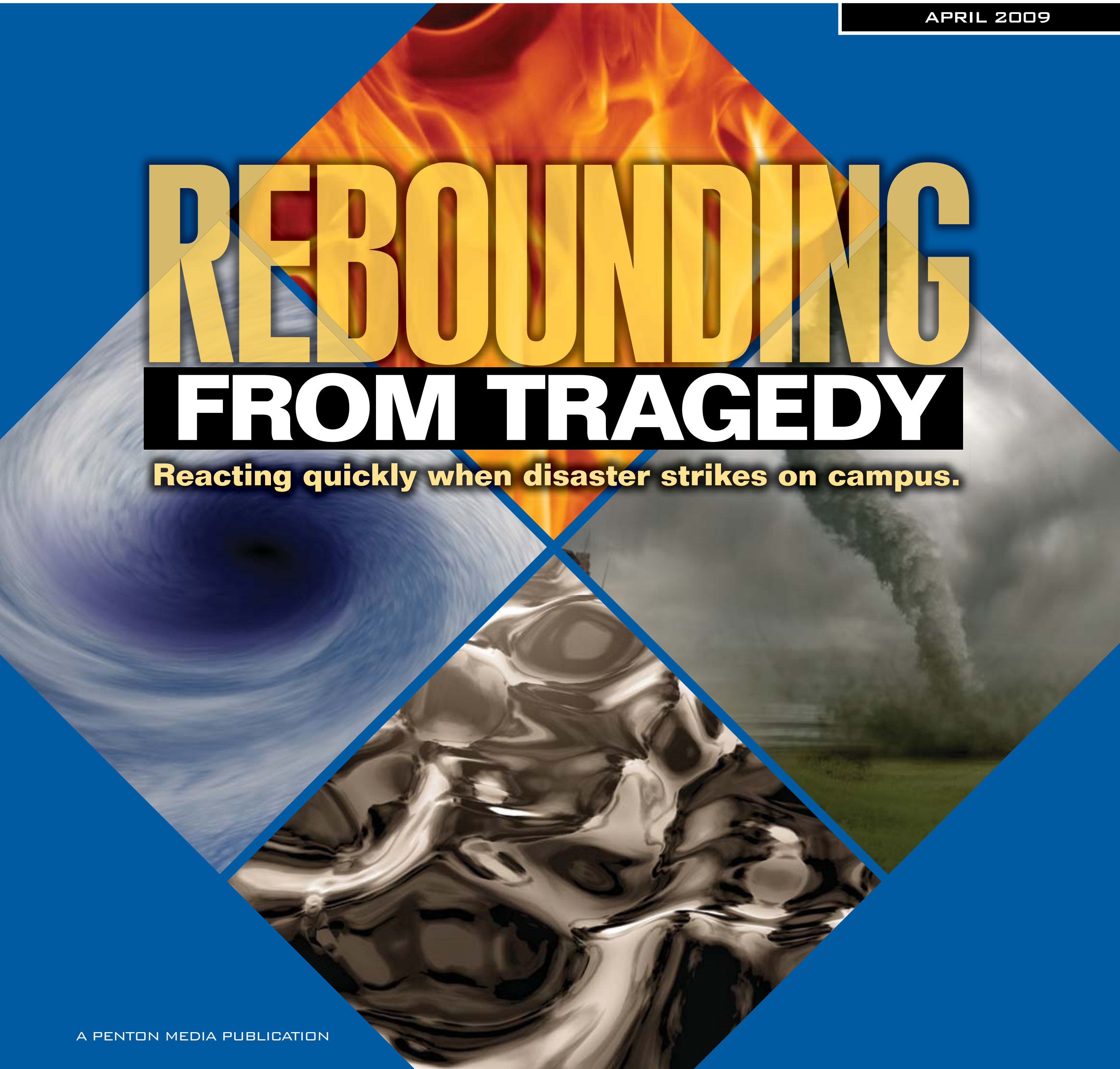
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REBOUNDING FROM TRAGEDY

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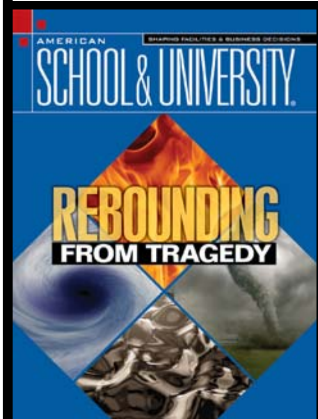
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DEPARTMENTS



COVER STORY



On the Cover:
This month's cover story: tips to better equip your staff in the event of a disaster on campus.

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Play Fever



Like many of you, I live in the Midwest. The winters are cold, and they seem to drag on forever. And after the holidays, the novelty of cold and snow gives way to the pain of spring fever (by the way, it is spring, and we still are wearing our winter coats). As the mom of a 3-year-old, I know how important getting outside and playing is—for well-being as well as health.

Adults need their playtime, too. The country is in an economic crisis, we still have soldiers at war, and unemployment rates have skyrocketed. Breathing in some warm air and getting some exercise can give us all a needed break.

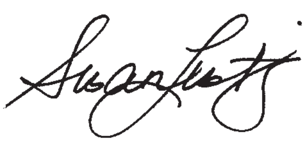
So when I read a new study by the Alliance for Childhood, it was a little concerning. Play time going away: huh?

The studies were conducted by researchers at UCLA, Long Island (N.Y.) University and Sarah Lawrence College (N.Y.). Their findings, documented in "Crisis in the Kindergarten: Why Children Need to Play in School," (www.allianceforchildhood.org) revealed that on a typical day, kindergartners in Los Angeles and New York City spend four to six times as long being instructed and tested in literacy and math (two to three hours per day) as in free play or "choice time" (30 minutes or less). Standardized testing and preparation for tests now are a daily activity in most of the kindergartens studied, and in many kindergartens, there is no playtime at all.

According to the studies, many people believe that kindergartners need to settle down and engage in serious learning. They see play as a "waste of time, or worse, a descent into chaos."

Among other things, the report calls for a refocusing of early education on well-designed play-based approaches. It says that numerous studies have shown that children who engage in complex socio-dramatic play develop higher levels of thinking, stronger language skills, better social skills, more empathy and more imagination than children who do not play in this way. Play also lowers stress levels in children.

I'd venture to add that a little more playtime might lower stress levels in adults, too. ■



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INSIDE: ENVIRONMENTALISM



WIND-POWER CREDITS WILL OFFSET ENERGY USE AT UNIVERSITY OF KANSAS

The Student Environmental Advisory Board at the University of Kansas has begun buying wind-power credits from an electric utility to offset fossil fuel power to Anschutz Library on the Lawrence campus.

Student fees of $1.25 per semester will enable the board to purchase wind-energy credits equivalent to the amount of power it takes to supply the building for a year. The university says Anschutz uses about 2.8 million kilowatt hours of energy each year.

Figures provided by the utility, Westar Energy, show that every 100-kilowatt-hour block of energy the university buys enables the utility to eliminate the burning of 1,440 pounds of coal and the emission of 2,640 pounds of carbon dioxide annually. Using wind energy also saves about one gallon of water for each kilowatt hour of electricity produced by coal-powered generation.

SOLAR ENERGY FOR SAN JOSE SCHOOLS

The San Jose (Calif.) Unified School District has completed what is believed to be the largest K-12 solar and energy efficiency project in the United States.

The district has installed a total of 5.5 megawatts of solar power at 14 district sites. That is expected to reduce district energy costs by more than 30 percent and save more than $25 million over the 25-year life of the project.

San Jose Unified's use of solar energy is expected to reduce carbon emissions by more than 100,000 metric tons, equivalent to planting more than 1,400 acres of trees. In addition to the solar panels, the district will install interactive kiosks so that students can learn firsthand about energy use and the solar power generated on their campuses.

Chevron Energy Solutions built and operates the solar photovoltaic arrays and provides maintenance for them. Bank of America owns the solar equipment and sells power to the district under a service contract at set rates significantly below market utility rates. The California Solar Initiative and other incentives offset the overall cost of the program by more than $11 million.

AUBURN (WASH.) DISTRICT'S GREEN EFFORTS RECOGNIZED

The King County, Wash., Green Schools Program has honored the Auburn School District for improving its recycling practices and other conservation efforts.

With assistance from the Green Schools Program, recycling rates at 16 of the district's 22 schools have risen during the past two school years. For instance, Gildo Rey Elementary School increased its recycling rate from 43 percent to 67 percent. That enabled the school to reduce garbage pickup to once a week instead of twice a week and saved about $425 a month or $4,230 a year.

Other energy- and water-saving steps in the district: installing programmable thermostats in portable classrooms; maintaining "energy misers" on vending machines; checking schools for personal-use appliances, which are discouraged by policy; using software that shuts down computers after extended periods of inactivity; installing faucet aerators and low-flow faucets; and installing rain gauges on all irrigation systems. ■

HOMEGROWN STATISTICS

Farm to School programs, which connect schools with local farms, are becoming more popular. The movement enables education institutions to support area farmers by acquiring healthful, locally grown food that can be served to students in school cafeterias.

40	States with operational farm-to-school programs
2,051	Farm-to-school programs in the United States
8,776	Number of schools involved in farm-to-school programs
2,039	Number of school districts involved in farm-to-school programs
30 million	Estimated number of students who eat a school lunch 5 days a week

Source: National Farm to School Program

CONSTRUCTION ZONE

Cutting-edge labs

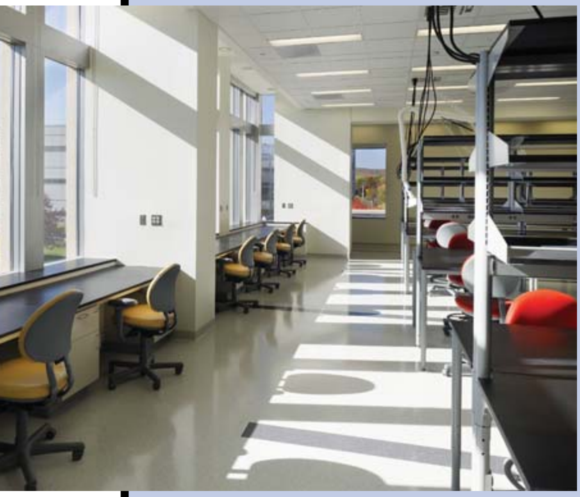
As part of a long-term strategy to bolster and expand research, Virginia Tech wanted to add laboratory, teaching and research space to its campus. Two buildings were designed for the Institute for Critical Technology and Applied Science (ICTAS): ICTAS 1 and ICTAS-A.

The 99,000-square-foot ICTAS-1 includes BSL 2 research laboratories; classrooms; administrative offices; common-use rooms for specialized multi-user functions; and work spaces for research faculty and post-doctoral appointments.

The laboratories are designed to support the cutting edge of applied and fundamental research in multidisciplinary areas, including bioengineering, biomaterials, nanotechnology, communications technology and sensor technology. These areas of focus will change over time, so adaptability is a driving factor of the design. The $38 million project was completed last fall.

ICTAS-A, a new, two-story 33,000-square-foot building, will support ICTAS-1. It will be home to the Nanoscale Characterization and Fabrication Laboratory.

Architect for both projects is Burt Hill (Washington, D.C.).



Virginia Tech University, Blacksburg, ICTAS-1 Building. Photo courtesy of Jeffrey Totaro



West Point, Jefferson Hall-USMA Library and Learning Center, N.Y.
Photo courtesy of Tom Kessler

Open to the future

Last fall, West Point opened the Jefferson Hall-USMA Library and Learning Center on the U.S. Military Academy's Hudson Valley, N.Y., campus, a National Historic Site. The $62 million, 141,000-square-foot building brings together the Cadet Library, the Center for Teaching Excellence (CTE) and the Center for Enhanced Performance (CEP). The CTE provides faculty instructional spaces, and the CEP assists cadets with learning techniques and problem-solving methods.

Interactive learning centers, group study, technology-rich classrooms and 900 individual study spaces emphasize the integration of a variety of teaching and learning tools, and foster student-faculty interaction. The library also serves as a repository for more than 1 million books and other materials.

The six-story granite and glass building advances West Point's 19th-century, Military Gothic style into the 21st century. Jefferson Hall's two end towers are composed of granite blocks. Centered between the towers is a full-height curtainwall, composed of blast-resistant glass and precast concrete mullions, which frames views of the campus, bluff and river beyond. Other design elements include amber-colored glass brick to filter light into an archival area partially below grade, and exposed structural clay tile walls to bring warmth to the entry lobby and collection areas.

The building has achieved a bronze rating under the Army's SPiRiT program—similar to a LEED certification. STV (New York City) is architect of record and engineer; and Holzman Moss Architecture (New York City) is design architect.

Start: 2005
Completion: 2008
Project area: 141,000 sq. ft.
Cost: $62 million

SCIENCE/RESEARCH FACILITIES

Learning at "sea"

California Maritime Academy, Vallejo, Calif., is one of only seven degree-granting maritime academies in the United States. The school's curriculum is a specialized combination of classroom instruction, experiential learning and professional development to prepare students for careers in the marine industry.

California Maritime's new $7.2 million, 21,000-square-foot Simulation Center replicates the feel of being at sea and provides cadets with complex situations commonly faced by maritime crews around the world. All simulation suites enable students to navigate ships and vessels with life-like accuracy in a variety of environments, weather conditions and events of global impact. Simulation sessions are recorded to monitor how cadets react to the unexpected and how they can respond better to serious situations.

The two-story, steel-braced frame structure is organized by three main components: an elongated classroom and office block, and two double-height, full-mission bridge simulation suites. Lecture space, a technical library, conference rooms and other support spaces also are included.

Architect for the project, which was completed last fall, is NBBJ (San Francisco). ■



California Maritime Academy Simulation Center, Vallejo, Calif.
Photo courtesy of Bruce Damonte

Lighting

Tips for illuminating classrooms and other educational spaces.



For nearly a decade, schools and universities have been inundated with information on the benefits of incorporating daylight into their facility designs.

But even the most ingeniously designed educational spaces will need electric lights to supplement daylight or to illuminate interiors after the sun sets.

The *Advanced Energy Design Guide for K-12 School Buildings*, developed by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), offers school planners several recommendations on good lighting design:

•**Interior finishes:** For electrical lighting to be used efficiently, the guide says, spaces must have light-colored finishes. The ceiling reflectance should be at least 70 percent (preferably 80 to 90 percent). In most cases, that will mean smooth white acoustical tile or ceiling paint. The average reflectance of the walls should be at least 50 percent. In general, that will mean light tints or off-whites for the wall surface.

For ceilings, a flat painted surface or acoustical tile is the most efficient. Sloping ceilings and exposed roof structures may significantly reduce the effective ceiling reflectivity, so make sure the ceiling and all components are painted a high-reflectance white.

•**Sensors:** Schools should use occupancy sensors in all classrooms, offices, mechanical rooms, restrooms and special-use spaces. "The greatest energy savings are achieved with manual-on/automatic-off occupancy sensors if daylight is present," the guide says. "This avoids unnecessary operation when electric lights are not needed and greatly reduces the frequency of switching."

The two primary types of occupancy sensors are passive infrared (PIR) and ultrasonic. PIR sensors should not be used in rooms where a user cannot see the sensor (e.g., storage areas with multiple aisles, restrooms with stalls). High airflow can disrupt ultrasonic sensors, so they should not be used near air duct outlets.

•**Circuiting and switching:** As instruction relies more on technology, lighting and controls in classrooms now must take into account the requirements of video images. "New schools should be designed with the anticipation of substantial daily classroom time with the lights dimmed and video replacing the whiteboard as the principal teaching medium," the guide says.

That means a classroom will need two distinctly different lighting setups: a "bright" classroom with light levels of 30 to 70 footcandles throughout the room, and an "audiovisual" scenario that limits light on the screen to 7 to 15 footcandles. Adapting the lighting to accommodate both can be difficult.

"There is the distinct chance that once shades are put in place for (audiovisual), they will be left there all day, effectively preventing daylighting," the guide says. "The preferred solution is to educate teachers about the importance of daylighting. An alternative and more foolproof solution is to use electrically operated shades that automatically retract when lights are turned on …. Unfortunately, this is considered too expensive for most projects." ■ *–Mike Kennedy*

NOTABLE

26 Percentage of electricity consumption in a typical school that goes for lighting.

30 to 50 Percentage of lighting energy in a school that can be conserved through retrofitting.

25 Number of years that an Energy Star-rated LED exit sign can last without lamp replacement.

Source: U.S. Environmental Protection Agency, "Energy Star Building Upgrade Manual"

REBOUNDING FROM TRAGEDY





In June 2008, an Iowa River flood affected the University of Iowa's Iowa City campus. Flood recovery costs are estimated at $740 million. Photos courtesy of UI News Service

Schools and universities hit by disaster need to react quickly so that students can resume their education with minimal interruption.

BY MIKE KENNEDY

It can happen suddenly—a shockingly random burst of violence from a person on campus, or a spark from a fallen wire that ignites a devastating blaze. It can happen with plenty of warning and still be catastrophic—a relentlessly rising river that spills over its banks and swallows part of a school campus.

Some regions are prone to hurricanes, tornadoes, floods or earthquakes. Other tragedies, such as fires or acts of violence, can occur just about anywhere. Regardless of the specific type of disaster, schools and universities must be prepared to cope with crises that can disrupt operations, destroy facilities, and displace students and staff.

Education administrators need to respond quickly to rebound from such incidents because students are depending on them to provide an environment where they can recover—and continue to learn.

Fire and ice

In December 2007, an ice storm struck the Oklahoma City area; it brought down electrical lines and knocked out power for many, including the high school in Jones, about 15 miles east of Oklahoma City.

So when a fire started—apparently from downed power lines—on the roof of Jones High School in the early morning of Dec. 10, the fire alarm was not functioning. By the time the flames were detected and firefighters were able to respond, the facility was consumed with fire. No one was injured, but more than 300 students lost their school.

With the help of many individuals,

businesses and organizations in the community, Jones school officials acted quickly to get students back into classrooms and began putting together plans to rebuild.

"Other districts around here were out for five days because of the ice storm," says Jones superintendent Michael Steele. "Even with the fire, our students were out only seven days. Things really fell into place."

Immediately after the fire, the district set up classrooms in the back of a gymnasium and in a vocational-agricultural building that were spared from the flames. The county government, Oklahoma State University's Local Technical Assistance Program and area businesses came together to help the district construct pads for portable classrooms. Without a cafeteria, students were served lunch at a church across the street.

Students and teachers made do, but conditions were hardly ideal. To get to and from classes, they often would encounter wind, rain and snow.

"You don't want your students having to go through that," says Steele. "Their hallways are gravel. They get soaking wet walking to classes. Their book bags get frozen. But they've really fared pretty well."

A temporary site is more palatable when those involved know a permanent solution is on the way. Voters in the Jones district provided that permanent answer in April 2008, when they approved a $12.4 million bond proposal.

"We had 80 percent approval," says Steele. "We were very pleased with the results."

Combined with insurance proceeds, the money is enabling the district to build a new Jones High School. The high school will have two stories, with 26 classrooms and a cafeteria. It will have capacity for 400 students. The campus also will have a newly built gymnasium.

"They are putting up the tilt-up walls for the gymnasium as we speak,"

A memorial for victims

A year after a gunman opened fire in a lecture hall and killed five people before taking his own life, Northern Illinois University has unveiled plans to build a memorial garden on its DeKalb campus near the site of the tragedy.



Northern Illinois University, memorial garden. Rendering courtesy of HKM Architects + Planners, Inc.

The garden, just east of Cole Hall, will have a curved, peaceful walkway and five illuminated sections of cardinal red granite that will serve as a memorial to victims of the Feb. 14, 2008, shooting. Each of the five sections of granite will be 10 feet wide and 4½ feet high, and each will be engraved with the name of one of the five students killed. More than 20 trees will be planted at the site, and a sculpture will be commissioned for the garden.

"Memorial Garden will honor the memories of the five students we lost that day, while at the same time embracing the resolute Huskie spirit characterized by 'Forward, Together Forward,'" says Northern Illinois president John Peters.

The students lost their lives when former NIU student Steven Kazmierczak interrupted a geology class at Cole Hall and began firing. In addition to the fatalities, more than a dozen were wounded before Kazmierczak killed himself.

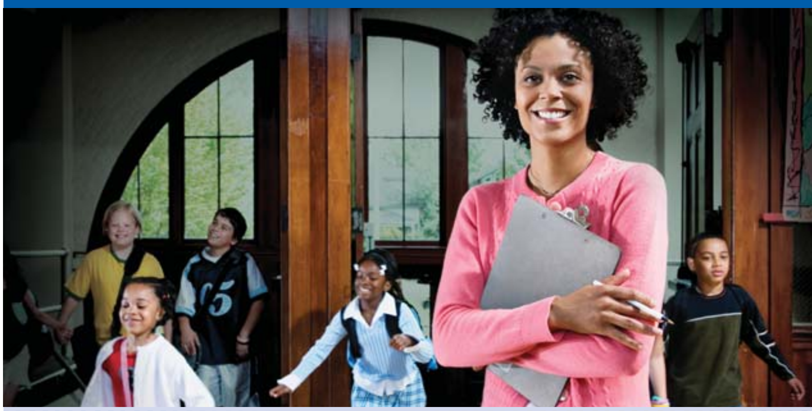
In the days after the tragedy, the university considered tearing down Cole Hall, but after soliciting input from students and others in the community, school officials decided to preserve and renovate the space. A $7.7 million building plan calls for the lecture hall where the shooting occurred to be converted to non-classroom use. Another lecture space in Cole Hall will be used again for that function after being renovated.

The project also calls for construction of a 500-capacity lecture hall elsewhere on campus to replace the classroom space no longer available in Cole Hall.



The construction of Jones High School, Jones, Okla., has been made possible by a 2008 bond issue that passed with 80 percent approval. Rendering courtesy of LWPB Architecture

There are some places where compromising on security is just not an option.



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The new Jones High School is scheduled for completion in May 2010. Rendering courtesy of LWPB Architecture

says Steele.

With the perspective of 15 months since the catastrophe, Steele describes the experience as bittersweet.

"There is some nostalgia about the old school," he concedes. "What people inquired about most after the fire were the senior pictures that hung on the walls. The fire didn't just burn the pictures, it disintegrated the frames they were in. We're trying to go back and restore as many of them as we can."

But Steele believes the promise of the future can compensate for the memories that were turned to ashes.

"Without the fire, Jones never would have passed a bond issue of this magnitude," he says. "Everyone's really eager to get into the new high school."

The building is scheduled to be finished in May 2010.

Getting the word out

One of the critical missions for an education institution beset by a crisis is to keep its constituents informed on what is happening and how they should respond. Schools and universities can use the Internet and other technologies to provide students, employees and community members with frequent updates as a crisis evolves.

At the University of Iowa in June 2008, officials watched with increasing alarm as Iowa River water levels rose and it became clear that flooding would affect the Iowa City campus.

"We knew it was coming," says Stephen Pradarelli, director of news services for the University of Iowa. "If it did hit, we wanted to be able to update the website remotely and have multiple people with the ability to update it."

Because it would have been difficult to use the university's internal system for remote updating, the quickest way to set up a site with off-site access was to use an external blogging tool and set up a blog for flood updates.

"We put out what buildings were closed, and what parts of campus to stay away from, which summer programs that had to be cancelled or rescheduled," says Pradarelli. "It was real-time updating of mission-critical issues."

The blog was an especially effective way to disseminate information for a flood, Pradarelli says. Unlike a tornado or fire that occurs quickly and may be over before officials can get the word out to people, flooding conditions develop and change over days and weeks, and the information that people connected to a campus need to know also will change.

The first blog post was made on June 5 before the campus flooded to let people know about road closures and alternative routes on campus. Over the next several days, the blog solicited for volunteers to fill sandbags, reported relocation of classes and some activities, and cancellation of other events.

By June 12, the blog entries were carrying a more serious tone. "The flooding situation on campus, in the community, and in our region is growing more dire by the minute," a message from university president Sally Mason warned. "We will very soon see unprecedented threats to our campus and community."

The blog offered health warnings related to flood water, resources for those seeking mental-health services, and tips for coping with stress and anxiety. It sought volunteers to help move books from the library, and kept others informed on where sandbagging volunteers needed to be deployed. Each day, a list was posted of which buildings were closed and which were ready to reopen.

"I think it absolutely became the Rosetta Stone of information for campus," says Pradarelli. "There was so much misinformation on campus. We were a kind of Rumor Control. It really fit the bill for what was needed. It served an important purpose."

Using an external system for a blog led to some problems. Because some of the postings were misinterpreted as spam, the blogging software threatened to shut down the blog, Pradarelli says. He was able to move the blog postings to a new site and continue putting information out.

"In the future, for something like this, I would try to use an internal system," Pradarelli says.

As the flood waters receded and some parts of the campus returned to somewhat normal operations, the blog postings were less frequent and

Coming back from Katrina

Student enrollment in New Orleans-area school districts:

	Jefferson	Orleans	Plaquemines	St. Bernard	St. Charles	St. John	St. Tammany
2004-05	51,666	66,372	5,952	8,872	9,797	6,559	36,169
Jan 2006	41,750	6,242	3,563	955	9,945	6,923	34,845
Oct 2008	44,018	35,955	4,521	4,684	9,606	6,410	35,878

less urgent. Even so, university staff members continue to post flood-related information on the blog (http://uiflood2.blogspot.com/).

"It's not playing the same role as it did early on," says Pradarelli. "It has now evolved to more big-picture issues."

In addition, as the university has settled into a post-flood "new normal," it has established a more permanent web site (http://www.uiowa.edu/floodrecovery/) with historical information and guidance about where to get help and flood-related services. It includes an "Iowa City Flood Digital Collection" with 3,400 photos from in and around the university campus and two dozen oral histories compiled by the university's anthropology department.

The flooding will continue to be a dominant theme on the Iowa City campus for years to come, as school officials try to determine how to restore or replace facilities still out of commission. In March, university officials estimated that flood recovery costs for the campus will run to $740 million.

The university website lists seven major campus buildings that were still closed for Spring semester—the Art Building, the Art Building West, Danforth Chapel, Hancher Auditorium, Hawkeye Court Apartments, Museum of Art and the the Voxman/Clapp Music Building.

"We still have a substantial part of the arts campus whose future is up in the air," Pradarelli says. "It will be years before the arts campus is re-established in some fashion." ■

Kennedy, staff writer, can be reached at mkennedy@asumag.com.

Incomplete recovery

More than 3½ years after Hurricane Katrina devastated much of the New Orleans area, school districts still are working to recover. Many of those displaced by the hurricane and the subsequent flooding have not returned.

The two districts hardest hit in terms of lost enrollment after the hurricane continue to report student numbers significantly below 2004-05 levels, the last full year before Katrina hit in August 2005. Orleans Parish reported 35,955 students in October 2008, 45.8 percent less than the 66,372 count in 2004-05. The St. Bernard Parish district had 4,684 students in October 2008, 47.2 percent less than the 8,872 reported in 2004-05. Jefferson Parish's October 2008 enrollment is down 14.8 percent compared with 2004-05, and Plaquemines Parish reports a 24 percent drop.

Districts such as St. John and St. Charles parishes that saw enrollment gains immediately after Katrina—in most cases from students displaced by the flooding—have seen those numbers return to about where they were in 2004-05.

The Orleans Parish recovery is more complicated because of the state's takeover of most of the district's education structure. The Greater New Orleans Community Data Center says that as of Dec. 31, 2008, Orleans Parish had 88 public schools open: 33 are operated by the state's Recovery District; five are run by the Orleans Parish board; 34 are charter schools under the auspices of the Recovery District; 14 are charter schools under the auspices of the Orleans Parish board, and two are independent charter schools.



Chalmette High School was the first school in St. Bernard Parish to reopen after Hurricane Katrina. To date, FEMA has committed $53.7 million to the repair and expansion of the school. Photo courtesy of Jacinta Quesada/FEMA



Martin Luther King Jr. School, Lower 9th Ward, New Orleans, was repaired after the hurricane. Photo by Manuel Broussard/FEMA





Sheyenne Ninth Grade Center
West Fargo, N.D.

Architect: YHR Partners, Ltd.
Photographer: Mark Lundberg

38TH ANNUAL MAINTENANCE & OPERATIONS COST STUDY

SCHOOLS



BY JOE AGRON

Despite the worst economic environment in generations, spending by K-12 institutions on maintenance and operations (M&O) held its own—defying historical trends that have shown M&O spending among the most affected in times of budget tightening.

According to data collected for *American School & University*'s 38th annual Maintenance & Operations Cost Study, the median school district allocated 9.57 percent of total district expenditures (TDE) to M&O in the 2008-09 school year. This is an increase over last year, and much better than the abnormally low percentages reported earlier in the decade.

Whether a reflection of when data was collected (data reported is for the 2008-09 school year and reflects budgets passed prior to the escalation of the economic crisis) or that M&O budgets have suffered so much over the years that most operations already are "bare bones" and further reductions would cause crippling results, only time will tell.

However, school district operations remain under pressure. For example, although energy expenditures saw some relief, custodial staff is being tasked with more responsibility. With a median of 32,100 square feet maintained per full-time custodian (an almost 20 percent increase over last year's amount), facility directors must look continually for ways to improve productivity so that staff can work smarter, safer and more efficiently.

The following pages include data from the latest M&O Cost Study that can help you in benchmarking expenditures at your institution. Data provided reflect actual spending by school districts on M&O and are not intended to be "ideal" amounts. Numerous factors—age and overall condition of buildings, the labor market in your area, climate, etc.—also will affect your costs when compared with the national medians.

For those looking for additional data, go online at ASUmag.com. Look for the "Web Exclusive" icon throughout this survey that will direct you to a special online area—and exclusive data not found in the print version on M&O expenditures and operations at our nation's school districts.

Maintenance & Operations Costs
(Expressed in **median** dollars **per student**)

Total Payroll	**$426.88**
Custodial	$277.60
Maintenance	$118.31
Grounds	$30.97
Outside Contract Labor	**$48.08**
Total Energy/Utilities	**$295.13**
Energy (gas, electricity, other fuels)	$244.87
Utilities	$37.82
Trash Collection/Disposal	$12.44
Total Equipment & Supplies	**$67.03**
Custodial/Maint. Equip. & Supplies	$49.41
Grounds Equip. & Supplies	$17.62
Other	**$73.08**
Total M&O*	**$910.20**
Total District Expenditures (TDE)	**$9,509.62**
M&O as % TDE	**9.57%**

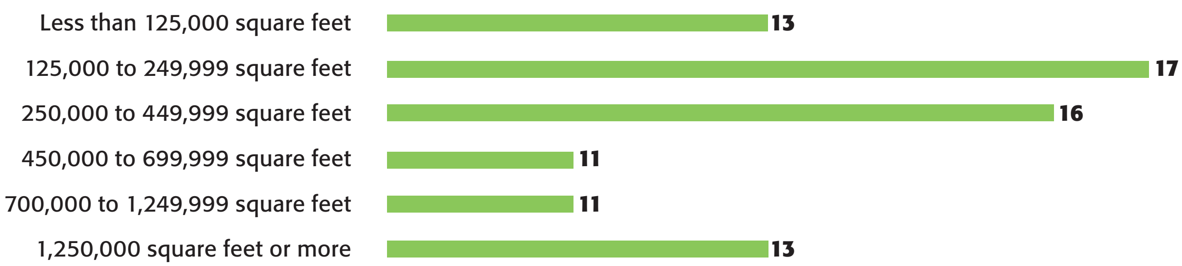
**Calculated from subtotals (in bold).*

Maintenance & Operations Costs
(Expressed in **median** dollars per **square foot**)

Total Payroll	**$2.07**
Custodial	$1.35
Maintenance	$0.57
Grounds	$0.15
Outside Contract Labor	**$0.23**
Total Energy/Utilities	**$1.43**
Energy (gas, electricity, other fuels)	$1.19
Utilities	$0.18
Trash Collection/Disposal	$0.06
Total Equipment & Supplies	**$0.33**
Custodial/Maint. Equip. & Supplies	$0.24
Grounds Equip. & Supplies	$0.09
Other	**$0.36**
Total M&O Budget*	**$4.42**
Total District Expenditures (TDE)	**$46.21**

**Calculated from subtotals (in bold).*

Total gross area of buildings maintained
(including corridors and other common and office areas of all district buildings) by survey respondents



**"No answer" represents the remaining percentage to equal 100%.*

Methodology

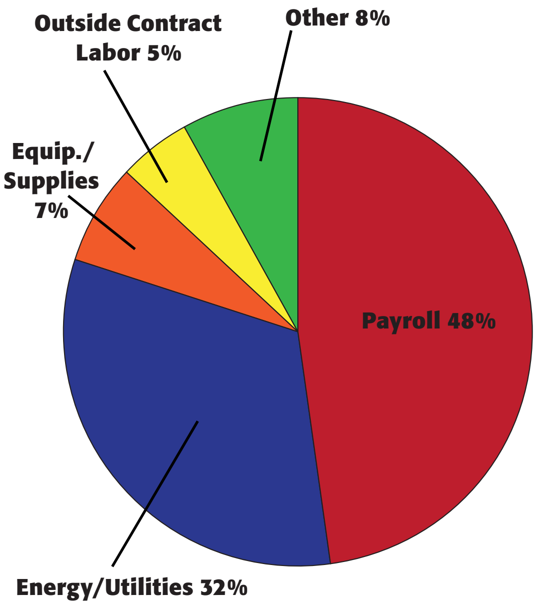
To arrive at data for the 38th annual *AS&U* Maintenance & Operations Cost Study, a detailed questionnaire was mailed in January 2009 to chief business officials and directors of facilities at the nation's public school districts asking them to document their institutions' M&O expenditures per student and per square foot for the 2008-09 school year. Categories include:

- **Per student**: Based on total district enrollment (average daily attendance as of October 2008).
- **Per square foot**: Based on total gross area of all district buildings maintained, including corridors, offices and common space.
- **Total district expenditures (TDE)**: Amounts for the 2008-09 school year.
- **Total maintenance and operations (M&O) expenditures**: Including salaries, benefits, outside contracts, utilities, energy, trash collection/disposal, equipment and supplies, etc., for custodial, maintenance and grounds.
- **Custodial**: Those individuals responsible for building upkeep and cleaning.
- **Maintenance**: Those individuals who perform skilled jobs, such as HVAC, electrical or plumbing repair.
- **Grounds**: Those individuals responsible for landscape upkeep and maintenance.
- **Payroll**: Including benefits.
- **Average salary**: Annualized, excluding benefits.
- **Outside contract labor**: Those hired for specialized jobs to maintain or repair building systems or equipment, such as HVAC maintenance or repair.
- **Energy**: Including gas, electricity and other fuels used to operate facilities.
- **Utilities**: Including water, telephone, etc.
- **Other**: Most often identified as clerical costs, equipment repair and rental, insurance and travel.

Continued...

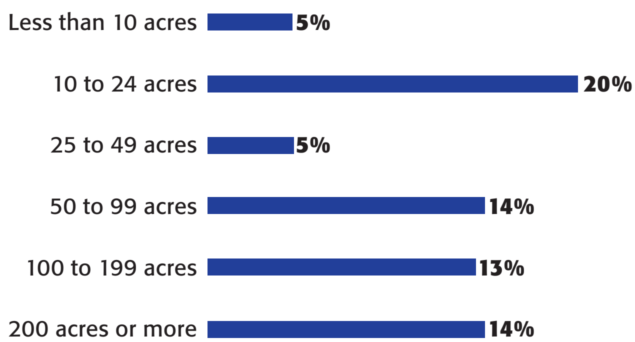
How the M&O budget is split

(based on median dollars per FTE student)



Total gross area of grounds maintained

(by survey respondents)



"No answer" represents the remaining percentage to equal 100%.

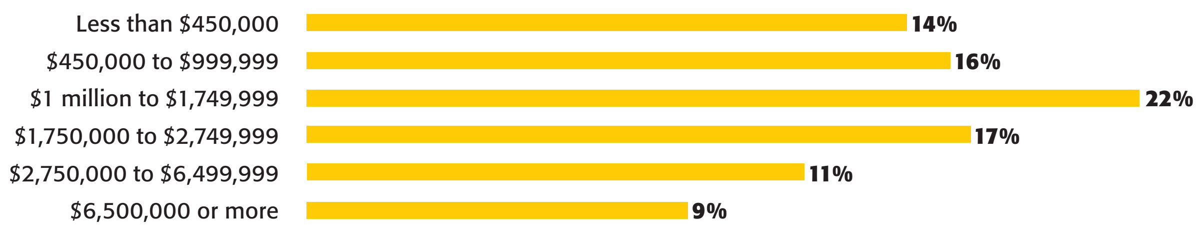
Green Cleaning in Schools

The percentage of school districts with a green cleaning program **23%**

37% The percentage of school districts (of those that don't have a program) that plan to add a green cleaning program in the near future

Total maintenance and operations expenditures

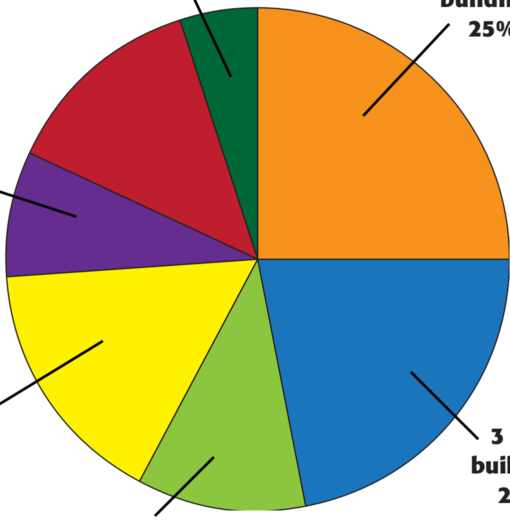
(per survey respondents)



"No answer" represents the remaining percentage to equal 100%.

Total number of buildings in district

(of survey respondents)



Privatizing M&O

11% The percentage of school districts contracting out maintenance and operations services

CLICK 101

WEB EXCLUSIVE

•CHART: Number of full-time maintenance, custodial and grounds staff

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Agron, editor-in-chief, can be reached at JAgron@ASUmag.com. Research conducted by Elinor Rice, senior research manager, Penton Media.

CONTINUED...





Montgomery County Community College, Advanced Technology Center, Blue Bell, Pa.

Architect: STV
Photographer: Halkin Architectural Photography

38TH ANNUAL MAINTENANCE & OPERATIONS COST STUDY

COLLEGES



BY JOE AGRON

The nation's colleges are feeling the pinch of the economic downturn, and maintenance and operations (M&O) budgets especially are under pressure.

According to *American School & University*'s 38th annual Maintenance & Operations Cost Study, the median college allocates 10 percent of its total budget to M&O, down from 11 percent the year before. While lower energy costs helped colleges' bottom lines, rising payroll and benefits costs strained budgets.

Like school districts, custodial and maintenance staff are being required to do more. The amount of square feet maintained per full-time custodian increased by 16 percent; the amount of square feet maintained per full-time maintenance worker increased by 13 percent.

The following pages include data from the latest M&O Cost Study that can help you in benchmarking expenditures at your institution. Data provided only targets two-year and four-year colleges with no significant graduate programs. This is done to provide more useful comparative data. Larger four-year universities with significant graduate programs are not surveyed because their costs and activities are so varied that results would be less useful.

In addition, data provided reflect actual spending by colleges on M&O and are not intended to be "ideal" amounts. Numerous factors—such as age and overall condition of buildings, the labor market in your area, climate, etc.—will affect your costs when compared with the national medians.

For those looking for additional data, go online at www.ASUmag.com. Look for the "Web Exclusive" icon throughout this survey that will direct you to a special online area—and exclusive data not found in the print version on M&O expenditures and operations at our nation's colleges.

Maintenance & Operations Costs

(Expressed in **median** dollars per **FTE student**)

Salaries	**$567.51**
Benefits (based on full-time only)	**$170.25**
Total Energy/Utilities	**$451.33**
Gas/Electricity/Other Fuels	$400.00
Utilities	$51.33
Total Equipment & Supplies	**$54.33**
Custodial/Maint. Equip. & Supplies	$40.33
Grounds Equip. & Supplies	$14.00
Vehicle Maintenance	**$10.33**
Other	**$50.00**
Total M&O Budget*	**$1,303.75**
% M&O of Total College Budget	**10.0%**

**Calculated from subtotals (in bold).*

Maintenance & Operations Costs

(Expressed in **median** dollars per **square foot**)

Salaries	**$2.39**
Benefits (based on full-time only)	**$0.72**
Total Energy/Utilities	**$1.90**
Gas/Electricity/Other Fuels	$1.68
Utilities	$0.22
Total Equipment & Supplies	**$0.23**
Custodial/Maint. Equip. & Supplies	$0.17
Grounds Equip. & Supplies	$0.06
Vehicle Maintenance	**$0.04**
Other	**$0.21**
Total M&O Budget*	**$5.49**

**Calculated from subtotals (in bold).*

Green Cleaning in Colleges

The percentage of colleges with a green cleaning program **56%**

50% The percentage of colleges (of those that don't have a program) that plan to add a green cleaning program in the near future

CLICK 101

WEB EXCLUSIVE

- CHART: Median amount of square feet and acreage maintained at colleges
- CHART: M&O salaries and number of employees at colleges

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CONTINUED...

Methodology

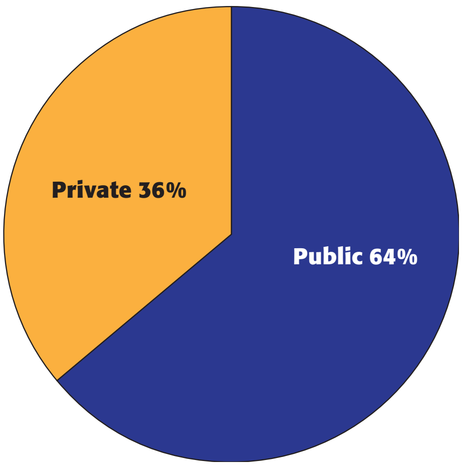
Data for the annual *American School & University* M&O Cost Study were collected via an in-depth questionnaire mailed in January 2009 to physical plant directors at two-year and four-year colleges with no significant graduate programs. Recipients were asked to document various M&O costs for the 2008-09 school year. The tables and charts detail median M&O expenditures per full-time-equivalent (FTE) student and per square foot, as well as the incidence of various maintenance practices.

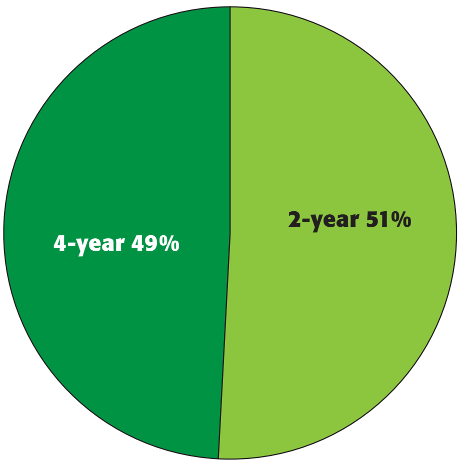
Among the titles included:

- **Administrative**: Those individuals who have managerial or supervisory duties (does not include the overall director of physical plant).
- **Custodial**: Those individuals responsible for building upkeep and cleaning.
- **Maintenance**: Those individuals who perform skilled jobs, such as plumbing, electrical or HVAC repair.
- **Grounds**: Those individuals responsible for landscape maintenance and upkeep.
- **Secretarial**. Those individuals providing clerical support.

Type of institution

(of survey respondents)





28 Mean number of buildings on campus of survey respondents.

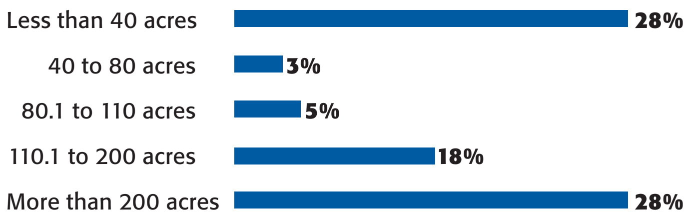
Number of buildings at institution

1 to 4 buildings	8%
5 to 10 buildings	21%
11 to 15 buildings	13%
16 to 25 buildings	8%
26 to 40 buildings	15%
More than 40 buildings	26%

**"No answer" represents the remaining percentage to equal 100%.*

Total grounds acreage maintained

(by survey respondents)



**"No answer" represents the remaining percentage to equal 100%.*

Total gross area maintained of all buildings

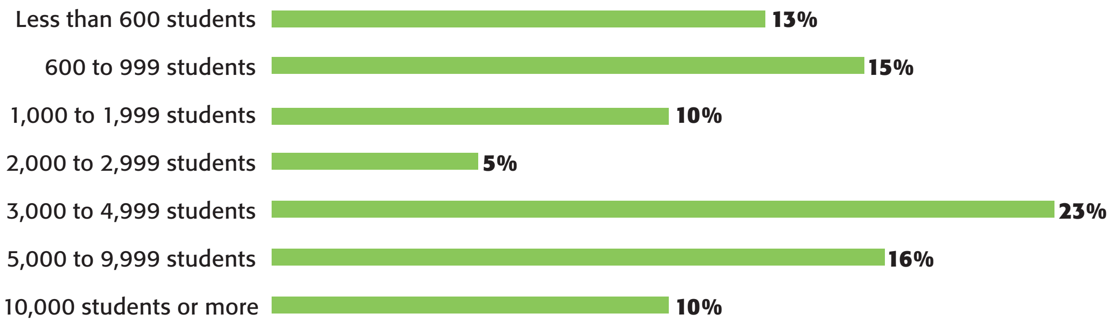
(including corridors and other common and office areas)

by responding institutions

Less than 150,000 sq. ft.	13%
150,000 to 299,999 sq. ft.	5%
300,000 to 449,999 sq. ft.	5%
450,000 to 599,999 sq. ft.	10%
600,000 to 749,999 sq. ft.	0%
750,000 to 999,999 sq. ft.	13%
1 million sq. ft. or more	23%

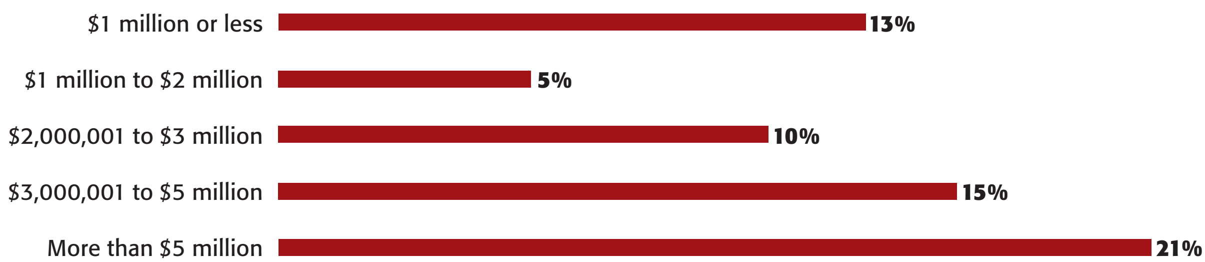
**"No answer" represents the remaining percentage to equal 100%.*

FTE enrollment
(of responding institutions)



**"No answer" represents the remaining percentage to equal 100%.*

M&O budget
(of survey respondents)



**"No answer" represents the remaining percentage to equal 100%.*

Privatizing M&O

13% The percentage of colleges contracting out maintenance and operations services

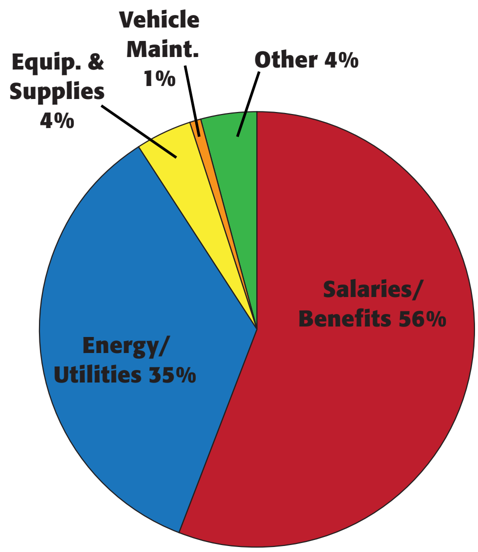
CLICK 101

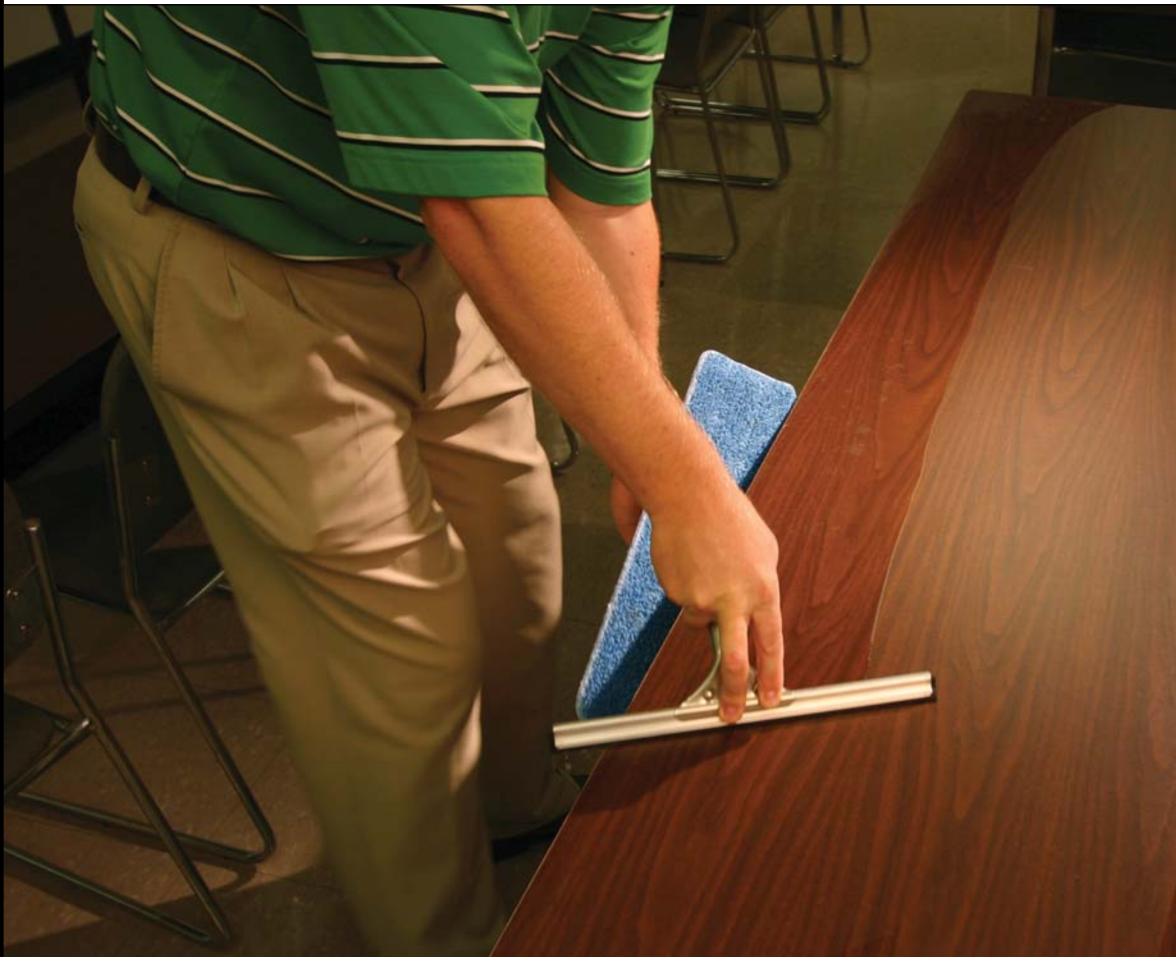
WEB EXCLUSIVE

- CHART: Median square footage of building maintained per FTE student
- TIMELINE: M&O expenditures over the past 10 years

Agron, editor-in-chief, can be reached at JAgron@ASUmag.com. Research conducted by Elinor Rice, senior research manager, Penton Media. ■

How the M&O budget is split
(median dollars per FTE student)





Education institutions need to provide custodians with tools they can use to create cleaner, more healthful buildings. Photo courtesy of Kaivac, Inc.

Measured Results

Integrated cleaning and measurement (ICM) can improve building operations and the health of students and teachers.

By Frank N. Wiley

Teachers have the "germiest" jobs in America. That's what Charles Gerba, a microbiologist at the University of Arizona, has concluded. Alongside more than 50 million students, teachers spend every school day trapped inside buildings with millions of invisible pathogens such as staph, E-Coli, shigella, influenza, MRSA and mold—pathogens that can cause serious illness and sometimes death.

Only one professional can do anything about getting rid of germs once they have infected buildings: the school custodian. Custodians should be the first line of defense against pathogens in schools. Unfortunately, most are not trained or equipped to deal with this invis-

ible world. They are armed with antiquated tools—mops and buckets, rags and spray bottles—that don't effectively remove bacteria or other micro-contaminants. In fact, they can spread it around, becoming disseminators that carry disease from surface to surface, classroom to classroom. As Gerba has noted, "Mops and rags give germs a free ride …. You can actually make things worse … if you are not cleaning properly."

Facility maintenance managers face an additional hardship: they are expected to confront this greater risk of infectious disease as they deal with reduced budgets and cutbacks. Caught between these conflicting goals, how is a manager to cope? One way, which may appear counterintuitive, is to integrate measurement as part of the daily cleaning process.

Measuring results

How can adding another step to the process help when staffs are being reduced? First, measurement enables custodians to determine if they are cleaning the right things in the right way. Second, it can provide evidence to concerned parents that the school is doing everything it can to keep kids safe.

Integrated cleaning and measurement (ICM) is an approach to cleaning that incorporates measurement as a cornerstone of the process. Education institutions want to be able to organize and equip staff to focus on results and then prove that what they are doing is effective.

The goal is to successfully con-

NOTABLE

The 5 C's of MRSA:
- **C**rowding
- Frequent skin-to-skin **C**ontact
- **C**ompromised skin (i.e., cuts or abrasions)
- **C**ontaminated items and surfaces
- Lack of **C**leanliness

Source: http://www.cdc.gov/Features/MRSAinSchools/



Choosing the right tools to clean can increase productivity dramatically.
Photo courtesy of Kaivac, Inc.

New tools of the trade

In the past, cleaning effectiveness was measured with our eyes and ears. Does it look clean? Does it smell clean? However, faced with growing health concerns related to invisible pathogens such as MRSA and norovirus, as well as airborne particulates, these simplistic methods no longer are sufficient.

Scientific measurement technologies exist that are simple enough for custodial staffs to use every day. The technologies can provide immediate feedback about cleaning products and processes. These include ATP meters, particle counters, infrared/moisture-detection systems and other measurement platforms that are becoming more available, portable and affordable.

Of these new technologies, one of the most promising for cleaning appears to be the ATP meter. ATP meters measure levels of Adenosine Triphosphate (ATP)—the energy molecule inside all living cells. ATP is found in bacteria, mold and fungus, as well as other matter that can provide a rich food source for these dangerous pathogens.

ATP measurement has been used in food processing for years, but until now, the cleaning industry lacked such precise and portable devices. By providing feedback in less than 30 seconds, ATP meters enable custodians to verify how clean surfaces are, and carry out continuous improvement programs to enhance overall performance.

nect measured cleaning results with improved student health and an improved bottom line. Maintenance managers want cleaning to be evaluated as much for health-based outcomes and operational effect as it is now for whether or not a school looks and smells clean.

As institutions measure and improve what they actually are doing—and publicize these successes—the benefits to student and teacher health and building operations will raise the level of respect that a district, school administration and parents have for the custodial department.

Setting standards

One of the basic challenges in measuring cleanliness is defining exactly what "clean" means. The maintenance industry has no real definition of "clean"—no standard against which to measure. That is about to change.

In June 2008, ISSA, the worldwide cleaning industry association, and the Cleaning Industry Research Institute (CIRI) announced a long-term partnership for the development of science-based cleaning standards that would generate industry data, training, measurement and certification programs. The first initiative this partnership will undertake is to pay for a series of independent research programs leading to the development of a "clean standard" for K-12 schools.

The subsequent goal of the project is to certify individuals and organizations with respect to their knowledge and use of methods that lead to measurable improvements in school cleanliness and hygiene.

The bottom line

Initially, incorporating measurement into a cleaning program can increase costs because of the purchase of measuring devices (see sidebar) and training. Is it worth it? Can you justify the increase? When the results help custodians focus on buildings' most critical cleaning issues and related health and operational outcomes, the answer clearly is yes.

For example, unsanitary restrooms represent a significant health hazard. That's because the restroom essentially is a bio-hazardous waste-transfer station—a primary source of infectious disease-causing organisms in a school as confirmed through scientific measurement. Studies also confirm that many bio-contaminants originating in the restroom ultimately make their way to other parts of a building, endangering the health of students and teachers. The reality is that a school cannot have a truly healthful building if its restrooms are not cleaned hygienically. And the only way to prove that a restroom has been cleaned effectively is through hygiene measurement.

Gerba recently conducted a controlled study to see what effect disease-

causing organisms in classrooms had on student attendance. First, through measurement, he identified the most contaminated surfaces in the room, including desktops, water-fountain toggles, pencil sharpeners, keyboards, paper-towel dispensers and faucet handles. To test the effectiveness of cleaning, six elementary classrooms were divided into control and intervention groups. The intervention groups were cleaned daily with a quaternary ammonium wipe and tested for bacteria. The study found that children in the control classrooms were 2.32 times more likely to be absent because of illness than children in the intervention classrooms. They also were absent longer.

What effect would it have on a school district's average daily attendance funding if, through integrated cleaning and measurement, it could reduce student absenteeism by 50 percent? Or, consider the West Coast university that used its documented cleaning results to convince parents that their children should reside on campus, rather than in apartments, thereby increasing overall school housing revenues.

Measuring productivity is another aspect of an ICM program. Choosing the right tools to clean—for example, switching to a spray-and-vac from a conventional restroom cleaning method, or switching to backpack vacuums vs. uprights in classrooms—can affect productivity by several hundred percent—and, in many cases, improve cleaning.

Demonstrating the effect of an ICM system on bottom-line results could help an institution justify current or even bigger custodial budgets, rather than deal with cuts. This could provide custodians with the most effective cleaning tools available. Leading manufacturers are developing science-based cleaning systems designed to remove the maximum amount of bio-pollution quickly.

For example, spray-and-vac or no-touch cleaning systems have been proven to be 60 times more effective in reducing bacterial contamination on tile and grout surfaces than mops. Other innovative products include flat-surface cleaning systems and touch-point cleaning tools that are designed specifically for the critical touch points identified in the Gerba study.

Measurements will show supervisors, the school board, concerned parents and the community that you are using the very best in cleaning systems. But, most important, by giving custodians the tools they need to eliminate diseases, mold and fungus, institutions can be measurably cleaner, safer and more healthful. ■

Wiley was one of the three original founders of the Cleaning Industry Research Institute (CIRI), and is a business consultant to the cleaning industry. He can be reached at fwiley@magnitudemarketing.com.





A biometric hand-scanning device was put in place this spring at the University of California–Irvine's Anteater Recreation Center. Photo courtesy of Ashley Cappel

Keyless Access

Electronic access control helps schools and universities manage who gets into their facilities.

By Mike Kennedy

A fundamental truth of building security is that one misplaced key constitutes a crack in the armor that protects a space from unwelcome intruders. Now imagine the headaches for administrators and security officials at a large university, where thousands of keys that are distributed to students and staff never find their way back to school officials.

For many years, the solution to this problem has been keyless access-control systems that use swipe or contactless cards to allow authorized users into a campus facility. As technology improves and card systems can be equipped with more functions, the appeal of card-based access-control systems

has grown for administrators and facility managers.

"Over the past decade electronic security technology has evolved from an exotic possibility into an essential safety consideration," says *School Security Technologies*, a report from the National Clearinghouse for Educational Facilities. "Technological improvements are coming onto the market almost daily."

The systems can be bolstered with additional layers of security, such as keypads, biometrics and video monitoring. In addition to access control, some cards can be programmed to include banking, vending, student data, library and other functions.

But unless schools adopt a campuswide card system, they won't be able to take advantage of many of the enhanced functions that computerized cards can offer.

Many schools and universities still depend on keys and locks to enter and exit many of their facilities. In some areas, that is sufficient. *School Security Technologies* points out when stronger steps might be needed: instances of burglaries in which locked rooms had no signs of forced entry; lost keys; lockdown plans that are heavily dependent on the extensive use of keys.

"If the keys are carried by only some staff members, or if the act of locking the doors would put teachers in the line of fire, or if teachers are likely to be physiologically stressed during the crisis, then an alternative plan is worth considering," the report says.

NOTABLE

50,000 Approximate number of keys issued to the Colorado State University community.

Source: Colorado State University, Key and Access Control Policy

Overcoming incompatibility

Some large university campuses with many buildings have installed keyless access-control systems at some of their facilities, but often individual departments have acquired different and incompatible access-control systems. Colorado State University in Fort Collins is

one of the campuses that over time has acquired a mix of lock-and-key systems and separate access-control systems at its various buildings.

"There are currently over 50,000 keys issued to the campus community, equating to over 20,000 key holders," Colorado State's Key and Access Control Policy states. "Many of these keys have not been returned once the individual left CSU due to employment or enrollment status."

The university now is in the middle of a push to adopt a campuswide system for keyless access control. Mike Rice, assistant trades manager in Colorado State's facilities management department, says the keyless access-control system chosen by the university has been installed in about a third of the 130 or so buildings on its Fort Collins campus.

"It gives us the ability to manage people who are coming through our campus," Rice says. "We eliminate the need to go through thousands of keys a year."

As the budget allows, the university will install the system at more buildings, Rice says. "We do access to the exterior doors first," he says.

Not every entryway on a campus requires elaborate security.

"It depends on what you're trying to accomplish," says Rice. "Putting access control on a closet, or even an office without a specific security need, would be very expensive. But for doors where multiple users are going through at any time, it makes sense."

And some parts of campus may require even more attention. Additional layers of security, such as keypads and personal identification numbers, or biometric identification systems, can prevent security breaches such as a user passing on an access-control card to an unauthorized visitor.

"At certain facilities, where there is more risk, we may install more hardware, such as cameras," says Rice.

One of the more attractive aspects of keyless access control is that a lost or stolen card is not as detrimental to security as a misplaced key can be.

"Electronic key cards can be cancelled instantly with a few key strokes, telling the system to reject the card if it is presented," says *School Security Technologies*, "and can even send an alert to tell a supervisor that someone has attempted to gain entry using the cancelled card—a far more efficient option than changing all the locks, or pleading with a fired employee to return a key."

Hand reader replaces ID cards at university rec. center

The University of California—Irvine, is replacing the card-based entry system at its Anteater Recreation Center with a biometric hand-scanning device.

The new security system, which was put in place for the Spring 2009 quarter, enables students and other recreation center members to gain access to the facility without an identification card. It also prevents people from gaining entry to the center by using somebody else's ID card.

The university says the hand-geometry system creates a database of members' identities by analyzing more than 31,000 points and recording more than 90 measurements of an individual's hand. Members seeking to enter the center place their hands on a scanning pad, and then enter a personal identification number to confirm their identities.

"The No. 1 suggestion from our members was eliminating the need for ID cards," says Jill Schindele, director of campus recreation.

Preventing piggybacking

A potential security gap for many electronically controlled entrances is the practice of piggybacking or tailgating. That's when a person authorized to enter a building uses their card or PIN to allow someone who may or may not be permitted into the building to come through the entrance. *School Security Technologies* says the problem is not the type of system being used, but the behavior of the users. It suggests that schools take these steps to combat the practice:

•Video monitoring or on-site security personnel that trigger alarms when piggy-backing occurs.

•Video recording of incidents to identify intruders.

•An access-control response, such as a lockdown of a second door preventing further entry, and an immediate response from security guards to confront intruders.

"Training for all legitimate users goes hand-in-hand with these tighter measures," the report says.

Vigilant about visitors

Many K-12 schools, reacting to instances of school violence, have become more diligent about checking who is coming in and out of their facilities. Some schools merely require visitors to stop into the central office, sign in and place a sticker on their lapel. Others may ask visitors to show some identification before receiving a sticker. More elaborate systems require visitors to provide identifying information that is checked against sex-offender registries, fingerprints or criminal records before a computer-generated visitor badge with photo is issued.

Edwardsville (Ill.) School District No. 7 installed a badge system in five of its schools for 2008-09.

"Every person visiting a District 7 school is required to show photo identification and is then issued a visitor's badge before proceeding to his or her destination," the district says. "The identification is scanned and entered into a database. The system searches the State of Illinois sex offender registry, and a visitor's badge is printed." ■

Kennedy, staff writer, can be reached at mkennedy@asumag.com.



A recent window-film installation at Brown University's John D. Rockefeller, Jr. Library, Providence, R.I., had several goals: block UV light to protect against fading, maintain a cool environment and allow a clear view in and out of the library.

A Clear View

Professionally installed window film is a simple way to block solar heat and reduce energy usage.

By Kathryn Giblin

From around the corner to around the nation, schools and universities are looking to reduce their energy bills. Some are concerned about fuel costs and the impact on their operating budgets; others are motivated by the desire to reduce their carbon footprints and their impacts on the environment.

Professionally installed window film can play a key role in energy savings—some estimate that window film can produce energy savings up to 30 percent. Conducting an energy analysis enables education administrators to determine where window film can yield the most substantial results. Choosing the right kind of window film and the right professional to install it can make classrooms more comfortable and reduce air-conditioning usage.

The reason window film saves en-

ergy is that it blocks solar heat, keeping a room more uniformly cool. In classroom buildings, the effect that window film has on overall energy consumption and interior comfort levels can be significant.

Analyze energy use

Schools trying to determine the best areas for energy conservation can receive assistance from energy service companies, utilities companies and certified energy consultants, as well as solar, glazing and window film experts, certified through local building associations, and national groups such as the European Window Film Association and Glass and Glazing Federation.

Many of these experts use a modeling program. They conduct analyses on trouble areas, such as office spaces with uncontrollable hot spots, entry areas with large atrium windows, or other areas with large windows or glass doors.

When considering an energy audit, look for sophisticated programs that take into account:

•Shape and size of a building or campus, including number of stories and occupants.

•Orientation of the building.

•Number of windows, type of glass and shade provided by awnings or trees.

•Statistical weather data.

•Building construction: materials used for walls, floors and roof.

•Heating and cooling system, including power and efficiency.

•Location of vents and thermostats, as well as the thermostat settings.

Comprehensive modeling programs that include these factors will quantify energy savings and comfort improvements more accurately throughout a building.

Several choices of window film are available. Facility managers should consider criteria such as safety, glare benefits or overall energy saving benefits before deciding which window films to buy.

How glass works

A comprehensive understanding of how glass works—and the process of heat transfer—can help schools and universities understand how window film works. There are three types of heat transfer: radiation, conduction and convection.

Solar energy (also called solar radiation) comes in through a window and is converted to heat when it strikes people or objects. If you block the transfer of solar energy, you keep it from turning into heat. Window film interrupts the transfer of energy by reflecting the majority of energy back outside the window (and absorbing the remainder). **(See Figure 1, p. 38)**

Through an untreated window, solar energy can take one of three paths: it can be transmitted, absorbed or reflected.

Some radiation is transmitted through a window. The percentage of transmitted radiation is equal to UV light + visible light + near infrared rays. Absorption is the solar energy that is soaked up into the window, and some light is reflected back to its source.

Understanding these three principles of glass is critical, as is knowing which type of windows are in the building. Some window films work primarily by reflecting solar energy; others work primarily by absorbing solar rays. If the wrong film is applied to certain low-e windows, for example, it can be forced to absorb too much solar energy, causing it to crack.

Blocking light from entering a

Evaluating window film installers

Window film installers have become a sophisticated group of technical and marketing experts—they must be as educated on energy savings as they are on window safety, as knowledgeable about building codes as they are about HVAC systems.

As window film has advanced, so too has the education of the manufacturers. Look for installers who can consult with you on your building needs. During a consultation with a window film professional, plan to cover your concerns and goals, and review energy consumption and your expectations for realizing a return on investment. Walk through critical hot spots and surrounding areas to gain a better understanding of the modifications window film can bring about.

Finally, consider using this checklist for verifying whether an installer is credible:

•What are the installer's accreditations?

•How long has the installer worked with this window film manufacturer?

•Who do you call with questions: the installer or the manufacturer?

•Is the warranty provided on the whole window or just the glass panes?

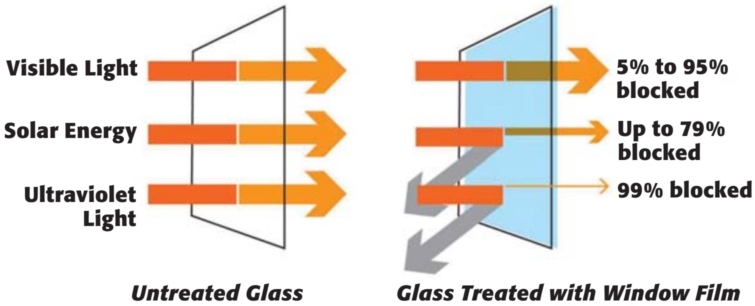


FIGURE 1

building also can be accomplished through interior window treatments and awnings. However, they mainly reduce glare, and are inefficient at blocking infrared and ultraviolet energy. Heat pockets, fading and other problems still exist. Window film offers a solution that reduces energy consumption and rejects UV radiation.

For many campuses, glare also is a concern. Films with lower visible light transmission (VLT) are better for glare control and privacy; higher VLTs offer more natural light. When selecting a film, administrators may want a consultant to walk them through these priorities so they can choose the film best suited to the conditions.

Most professionally installed window films with a shading coefficient of 0.50 or lower can help reduce the interior temperature in a facility. These slight changes in temperature can bring a reduction of up to a 25 percent in cooling costs. Because it takes considerable energy to remove heat from a room, window film can reduce the load on air-conditioning systems.

Choosing the right film

With many options for window film on the market, how can schools and universities identify the right ones? Consider outside endorsements from energy-focused organizations, such as the Clinton Climate Initiative. Also factor in the depth and longevity of the brand, the manufacturing capabilities and the extent of the dealer network.

If choosing a high-quality spectrally selective film (which blocks more infrared energy than visible light), schools should understand the technical differences of the two different types of film: ceramic and heat-repelling (HR) films. Ceramic films function primarily by utilizing microscopic grains to absorb nearly all infrared radiation (NIR) from the sun. This has the effect of capturing the energy from the sun into the coating on the film, which when applied directly on glass, retains the energy and therefore reduces heat gain into the building. A byproduct of absorbing solar energy in the film is that it raises the temperature of the glass, which under the wrong circumstances, can lead to window seal failures and glass breakage.

HR films use multiple thin layers of metal and metal oxides to reflect near infrared radiation away from building windows. Because HR films function primarily by reflecting—rather than absorbing—NIR radiation, HR films have lower absorption values, and there is less risk of seal failure or glass breakage when applied to windows. HR films prevent the solar heat from entering glass.

Manufacturing modern solar-control window film is a complex process involving high-quality raw materials and advanced technologies. If the application of window film is part of an institution's environmental initiatives, it should look for a manufacturer whose commitments to environmental standards matches its own. Ask about recycling and reclaiming programs, find out about waste disposal and verify that environmental sustainability is more than a fad by ensuring a long-term organizational commitment. ■

Giblin is vice president of marketing of Bekaert Specialty Films LLC, San Diego, Calif., which develops, manufactures and distributes specialty films for use as solar control, safety films and for industrial applications. She can be reached at Kathryn.Giblin@bekaert.com.

NOTABLE

30 Percentage of potential energy savings when using window film.



Brown University's library houses rare and historical collections of books and references, so blocking UV light with window film was essential to prevent fading.

WEB 101

Is the glare getting to you? Visit the Daylighting & Windows article archives section at ASUmag.com.

Practical Procuring

Leveling the playing field for technology bidders.

C. WILLIAM DAY



Day is senior analyst at KBD Planning Group, Young Harris, Ga., a firm specialized in educational facilities and technology planning. He can be reached at bday@kbdplanning.com. www.kbdplanning.com

Why do schools have a hard time selecting qualified technology bidders? First, schools that use lowest price only to select technology integrators either pay for what they get or don't get what they expected. Low-bid selection of technology integrators, required for many schools, is a confrontational process. Second, after a request for proposal (RFP) has been released and bids taken, the procedure for awarding changes.

The objective of procurement is to buy materials, supplies and equipment of the right quality in the right quantity from the right source at the right price at the proper time. When dollars rule, vendors look to create an advantage for themselves by disregarding some bid requirements to keep their price low. By looking only at dollars, the institution may turn a blind eye to the bid requirements it prepared. This scenario is becoming more prevalent in bidding technology projects.

Many reputable technology vendors are out there, and most play by the rules outlined in the bid specifications. Here is what happens: bids are received and given a loose evaluation, then award decisions are made—based not upon the bid specifications, but on some of the following:

•"This firm is just right down the street, and the low bidder is miles away."

•"This firm has done work with us before, even though they may be more expensive."

•"Even though they cost more, they have a good reputation."

•"Even though this bid is low, we just don't like the firm."

Although those reasons may be valid, the bid documents did not spell out or were not clear as to how the winning bid would be determined. When bids are not awarded to the lowest responsive bidder, it cheats those who played by the rules.

These unpleasant experiences could be minimized if education institutions developed a clear set of bid documents that include instructions for bidders (IFB). In general, public bidding documents are not required to include an IFB, but as a practical matter, it is critical. By the terms of the IFB, a school establishes the "rules of the game" for bidding. In the IFB, the institution can consider and provide for handling many of the typical issues that arise in competitive bidding, such as:

•Minimum qualifications to bid.

•References completed within a specific numbers of years on a similar scope of school projects.

•Strict conformity with product specifications and the bidding process.

•Bid security.

•A brief description of the evaluation criteria.

By providing well-defined bid documents, institutions can minimize the chances of rejected bidders challenging contract awards. Making sure bid documents spell out expectations will ensure that all bidders are treated fairly. ■

On Schedule

Is the four-day work week coming to your institution?

STEPHEN ASHKIN



Ashkin is executive director of the Green Cleaning Network, a 501(c)3 not-for-profit educational organization.
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Last summer, Utah imposed a mandatory four-day work week for its 17,000 employees (with exemptions for universities, courts, prisons and other "critical" offices). Since then, many county and city governments have followed. The workday is extended two hours, and the benefits for the work force and the environment are plenty.

Utah changed its schedule so it could cut costs at a time when gas prices were soaring. Utah also says the change will help its effort to achieve a 20-percent reduction in energy consumption by the year 2015.

How does a four-day work week affect the environment? A few ways: drastic reductions in crude-oil imports, greenhouse-gas emissions, employee exposure to pollutants, traffic congestion and auto accidents. Also, the programs may increase worker productivity, family time, job satisfaction and an employee's paycheck.

Some college students avoid Friday classes and seem to embrace a four-day work week. Brevard Community College, Cocoa, Fla., is in its second year of a four-day work week and class schedule. By closing buildings on Friday and turning down air-conditioning and heating systems, the school saved $267,000 during the first year.

Brevard's students have more time to study and work part-time jobs. Faculty and staff cite the savings in travel expenses, and extra time to handle family and household matters. Administrators have seen less staff turnover, an increase in employment applications, and an absenteeism rate that has dwindled to almost nothing.

Reducing absenteeism should not be taken lightly. A shorter work week is less strenuous and perhaps less stressful than a five-day schedule, and it brings other environmental benefits.

According to a recent California EPA study, 50 percent of a person's daily exposure to ultra-fine particles, which are linked to cardiovascular disease and respiratory illnesses, can occur during a commute.

Are there plans for a four-day work week at your school? Are you prepared to be at the decisionmaking table?

Classrooms and offices can be moved to a four-day week, but other facilities—residence halls, food service, athletics, healthcare—likely will continue on a traditional schedule.

Staff, including custodial workers, may prefer the new schedule, but some will be working a longer day. In addition, the potential savings likely will come from reducing energy costs associated with heating, cooling and lighting, and not from cleaning, which likely will be reduced on some days and increased on others.

Creating a healthful, high-performing school environment through rethinking schedules, operating hours and other strategies is filled with opportunities and risks. Be involved, so that your institution has the benefit of your expertise. ■

Focused Goals

Architecture 2030: one step at a time.

JAMES E. RYDEEN



Rydeen, FAIA, is an architect/facility planning specialist and former president of Armstrong, Torseth, Skold & Rydeen, Inc. (ATS&R), Minneapolis. He can be reached at Jrydeen@atsr.com.

Sustainable design, LEED certification, energy conservation, small class sizes, staffing, declining enrollment, excess space, closing buildings, deferred maintenance, budget deficits, and operations and maintenance costs are just some of the major building-related issues facing education institutions. So which issues take priority?

One focus should be on reducing energy consumption. When looking to cut greenhouse gas emissions (GHG) and lessen dependence on fossil fuels, we usually overlook the biggest source of emissions and energy use: buildings and the energy they consume.

Buildings are responsible for 50.1 percent of energy consumed in the United States. This includes energy used in the production and transportation of materials to building sites, the construction process and operation of buildings. Globally, the percentage is even greater. The building sector is the key source of demand for energy and materials that produce GHG.

Architecture 2030 (architecture2030.org), a non-profit organization, was established in 2002 by architect Edward Mazria in response to the global-warming crisis. Its 2030 Challenge urges the architecture and building community to adopt the following targets:

•All new buildings, developments and major renovations shall be designed to meet a fossil fuel, GHG-emitting, energy-consumption performance standard of 50 percent of the regional (or country) average for that building type.

•At a minimum, an equal amount of existing building area shall be renovated annually to meet a fossil fuel, GHG-emitting, energy consumption performance standard of 50 percent of the regional (or country) average for that building type.

•The fossil-fuel reduction standard for all new buildings and major renovations shall be increased steadily: 60 percent in 2010; 70 percent in 2015; 80 percent in 2020; 90 percent in 2025; and carbon-neutral in 2030.

These targets can be accomplished by using sustainable-design strategies, generating on-site renewable power or purchasing renewable energy (20 percent maximum) or certified renewable energy credits.

Since the 1970s oil shortage, buildings have reduced energy use significantly. Savings have been found in HVAC and electrical systems, the building envelope and equipment, furniture and fixtures.

For schools built before the 1970s, HVAC, plumbing and electrical systems are outdated and lack sophisticated energy-conserving features, including appropriate building shell insulation. These buildings must be renovated to attempt to reach the goals of Architecture 2030.

We cannot solve all the building issues facing institutions, but we can start solving them one at a time. Architecture 2030 presents a challenge to all schools. ■

Secure and comfortable

Colorado district enhances safety, security and comfort with integrated system



Harrison School District Two, Colorado Springs, Colo., security system monitoring

TAC. Harrison School District Two (HSD2), situated at the foothills of the Rocky Mountains just south of Colorado Springs, Colo., educates more than 11,000 students. In recent years, the district has paid greater attention to enhancing safety and security. In 2002, HSD2 passed a measure to upgrade its energy management and security systems in all 23 schools.

The district chose to install an Andover Continuum Facility Management System. In the first phase of the project, TAC partner Westover installed card readers on selected school perimeter doors, and HSD2 issued combination personnel badges/access cards to all staff members. The access cards also eliminated the costly and recurring rekeying of school locks. Next, every school was equipped with a digital video recording (DVR) unit. Cameras were purchased for all front lobbies, and surveillance for the exteriors and some interior areas was added in the middle and high schools. Older analog VCRs were upgraded to DVRs, and pan-tilt-zoom cameras were added in some secondary buildings.

Today, all perimeter school doors, with the exception of the main front lobby entrance, remain locked 24/7. Lobby entrances are unlocked during school hours, and a camera/DVR unit at each school records all activity. A monitor in the front office in each school enables the office staff to watch what is going on at all times.

The security system in each school is networked to the Central Administration Building, which monitors all the school facilities 24 hours a day. From here, Russ Coomes, coordinator of student services, can call up any of the district's 100 cameras and view streaming video instantly over the Ethernet network.

"The new digital video recording technology makes our jobs a lot easier," says Coomes. "We no longer have to hassle with changing out tapes constantly. The Integral DVR units are recording at every school building 24/7. The peace of mind that digital recording provides us allows us to focus on our primary goal, which is educating our students."

In addition to security management, HVAC control also is an important part of the system. Electrical demand limiting controls reduce peak kW demand and shave kWh usage. The HVAC and the security sub-systems run on the same network backbone, providing HSD2 a single, integrated facility-management solution. Having one software and hardware package simplifies training, service and day-to-day operations. Plus, with one centralized database, all alarms, both security and HVAC, come back into a single front-end workstation for easy access.

Circle 159 for more information ■ freeproductinfo.net/asu



Timber sports floors

Action Floor Systems, LLC. A new brochure introduces the company's line of solid-maple hardwood sports floor systems. Included is information on Action Floating, Fixed and Fixed-Resilient systems, and detailed cross-section illustrations of selected floors. The company specializes in high-performance sports floors constructed of hard maple timber grown in northern Wisconsin and upper Michigan.

Circle 150 for more information
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Energy recovery

Greenheck. The Model ERVe energy-recovery ventilator is designed for outdoor installations. It is weather-resistant and features a pitched roof and drainable base for better protection against water penetration. Other features include optimized blower performance for each housing size and multiple energy wheel options for selections based on horsepower, efficiency or recovered energy ratio (RER).

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HVAC service

Atlas Sales & Rentals, Inc. Atlas offers its national account customers in the portable heating and cooling market a single point of contact for all service needs, regardless of the number of locations; customized energy-response plans; and the flexibility to accommodate customers' ordering systems, including Web-based programming for simplified order processing. Products offered include MovinCool spot coolers, and other portable equipment for cooling and heating applications.

Circle 152 for more information
freeproductinfo.net/asu



Sports matting

Plastex Matting, Inc. Heronrib now is available in custom colors. Warm and comfortable, the safety matting has an embossed, slip-resistant surface with anti-bacterial and anti-fungal additives to ensure better hygiene for bare feet around swimming pools and in locker rooms.

Circle 153 for more information
freeproductinfo.net/asu

Security certification

SimplexGrinnell. The company has passed the review of the U.S. Department of Homeland Security to earn certification for its security, fire- and life-safety systems integration services under the SAFETY Act, a federal law that encourages the creation and sale of anti-terror products and services. Services that can be delivered under the act certification include fire alarm, fire sprinkler, fire suppression, integrated security, emergency communications, and special hazards systems and services.

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CONTINUED...



A clear view

Clear panels offer privacy for patients, a view for students

SpacePlus LLC. Crafton College, situated about two hours outside Los Angeles, was looking for a solution for its paramedic simulation training center. The challenge was to provide interior sliding glass doors for four training areas used by paramedics, so that students could see into the area through clear glass, and at the same time frosted glass could provide privacy to the patients inside.

The college chose "Combo" panels that enable students in training to look in from atop the 5-foot-high frosted panels through clear glass.

The panels were installed within a nine-week lead time from the order placement date.

Circle 160 for more information
freeproductinfo.net/asu



Crafton College, paramedic simulation training center, Yucaipa, Calif.



Lighting access

U.S. Architectural Lighting. Scilux, a contemporary fixture for public areas and parking lots, features Instaleze, a new concept in tool-less access to the lamp and ballast compartment. With Instaleze, a series of electrical quick disconnects enables complete removal of the optical assembly for easy replacement or servicing of lamps and the ballast plate. The fixture can be wall- or pole-mounted as a single unit or in clusters. It is available in a range of light-distribution patterns to ensure safety in public areas and dark-sky compliance.

Circle 155 for more information
freeproductinfo.net/asu



Folding fire doors

Cornell Iron Works, Inc. TranZform Accordion Folding Fire Doors are compliant for use in means-of-egress openings per the International Building Code. As per Evaluation Report ESR-2300, the doors provide an alternative equal to rated side-hinge swinging doors in means of egress openings such as elevator lobbies, horizontal exits and as opening protectives in fire-rated corridors. Units are built to order to fit openings up to 22 feet in height to a maximum of 1,600 square feet.

Circle 156 for more information
freeproductinfo.net/asu

Green tables

BioFit Engineered Products. All four of the company's table lines have been awarded GREENGUARD Environmental Institute Indoor Air Quality and Children & Schools program certification for low VOC emissions. The lines include the 10-seat oval, AdapTable, Fold-N-Roll and BioFit table lines.

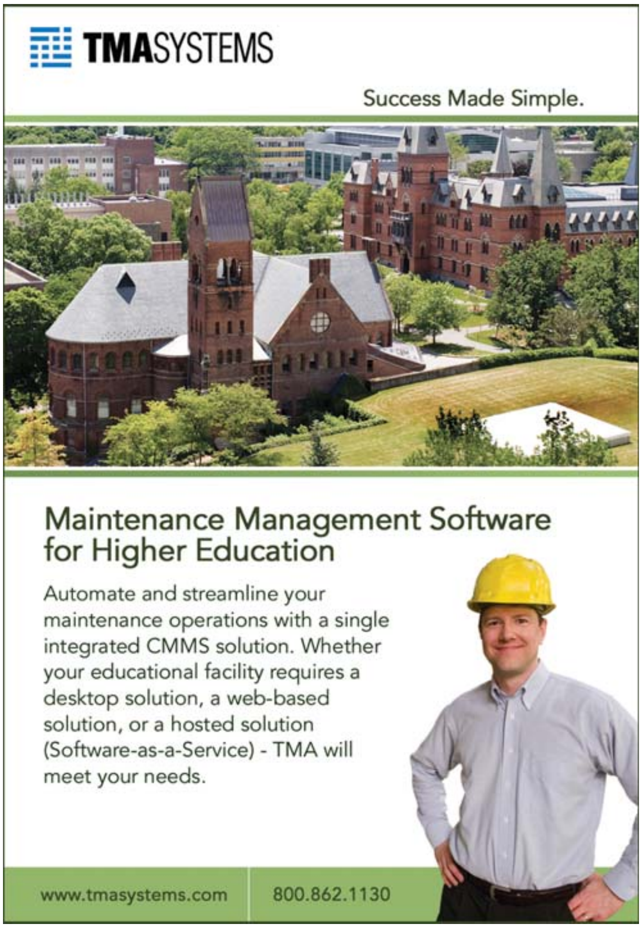
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Hygienic hand dryer

Dyson. The Airblade hand dryer uses the Dyson Digital Motor that spins 1,350 times a second, enabling a high-velocity blade of air to remove moisture from hands in just 12 seconds. It uses up to 80 percent less energy drying hands than warm-air hand dryers, and forces air through a HEPA filter, removing more than 99.9 percent of bacteria from the air used to dry hands. The dryer uses infrared sensors to start and stop automatically. ■

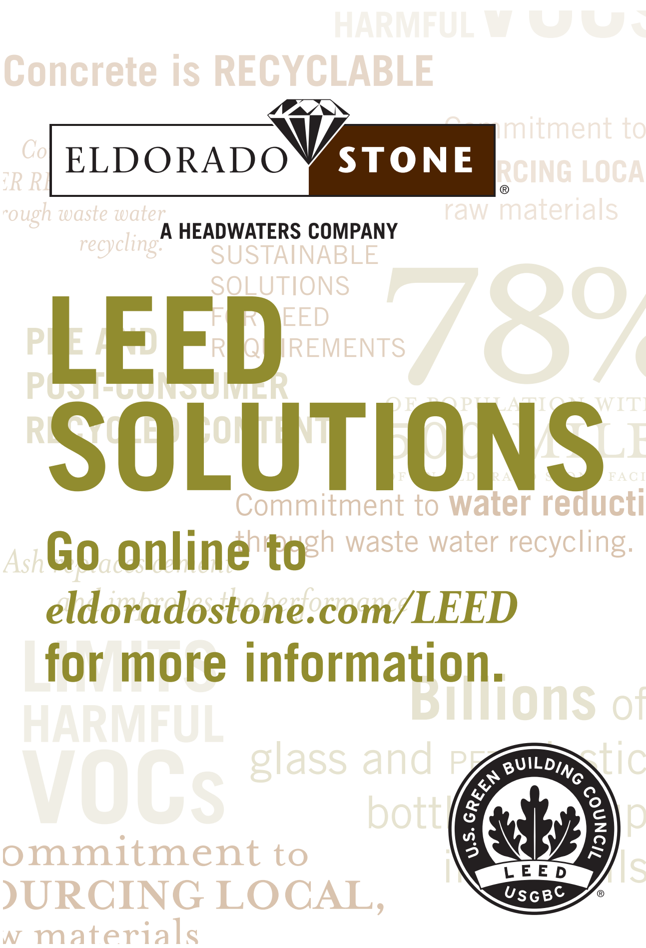
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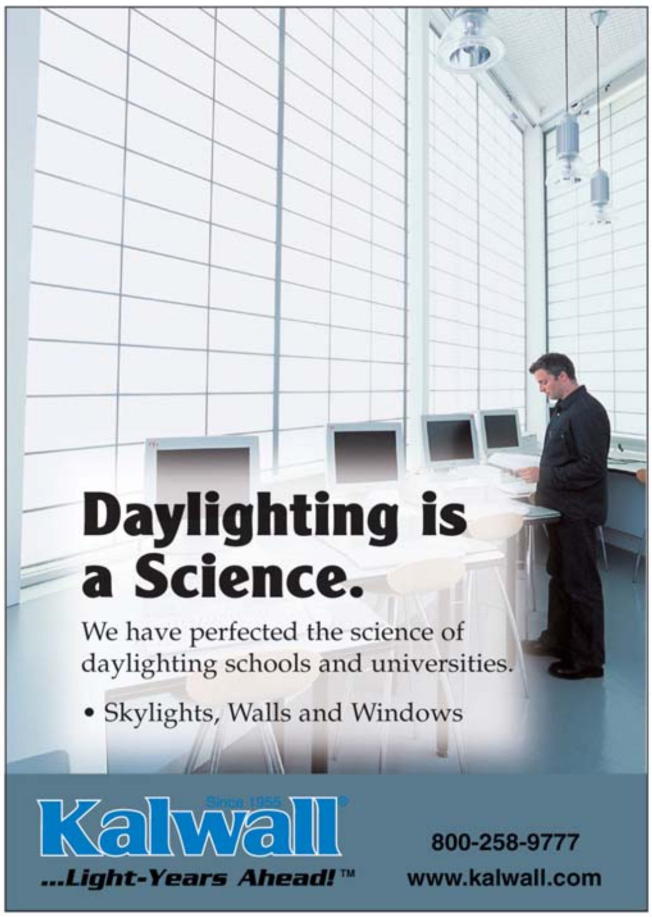
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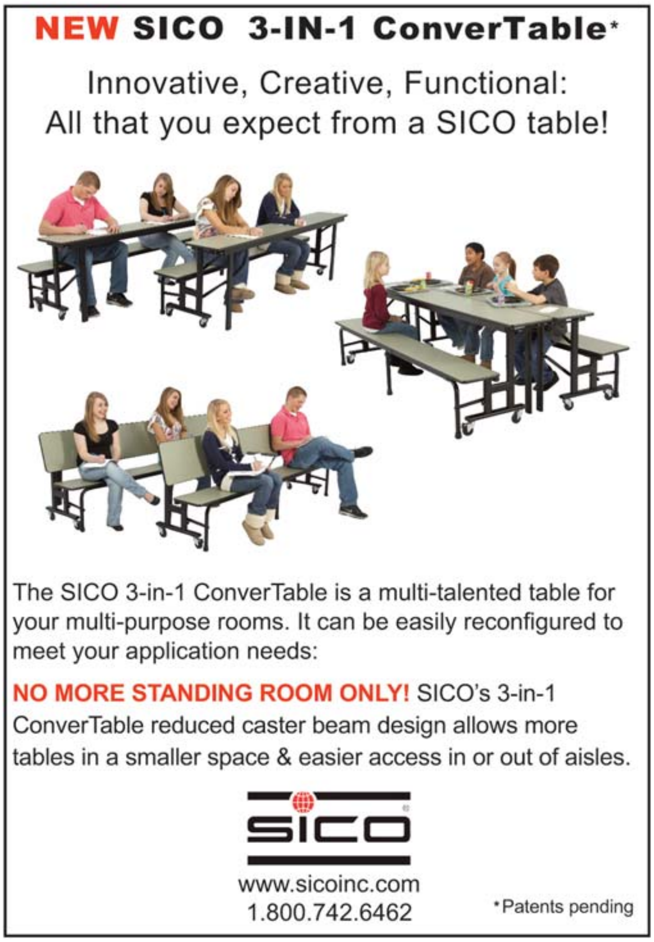
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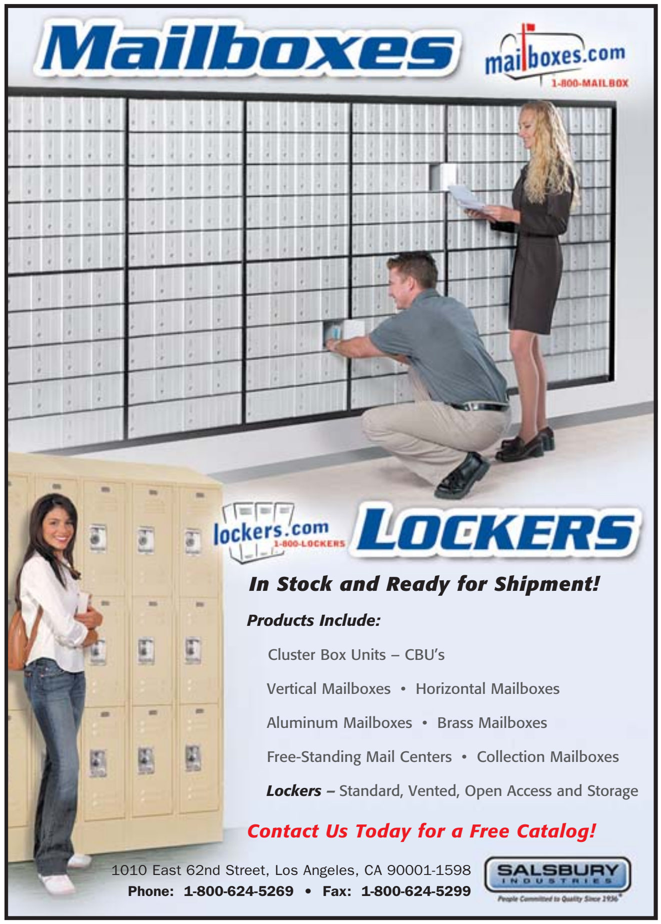
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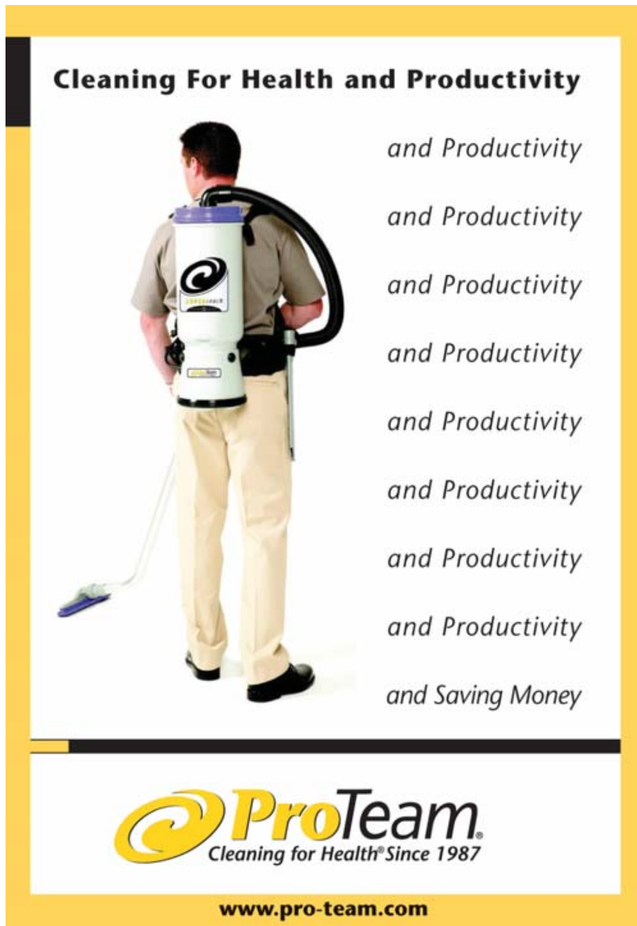
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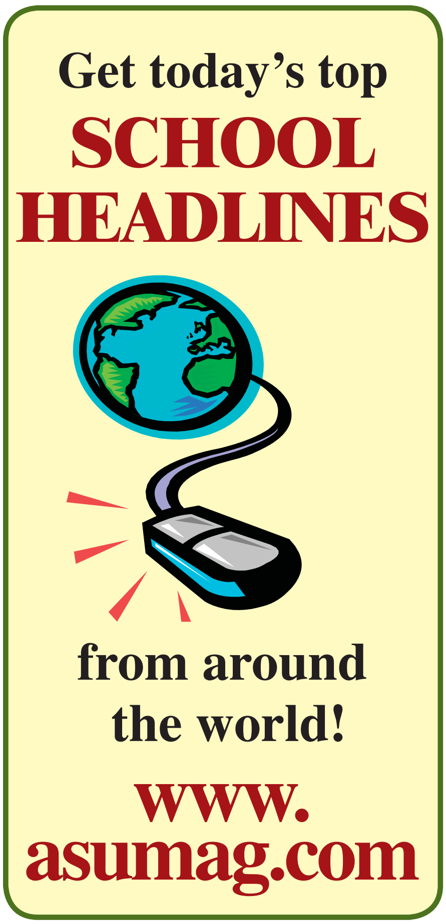
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AD INDEX

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For ad production questions, deadlines and ad specifications, please contact Brenda Wiley at (913)967-1817, Fax (913)514-6817.

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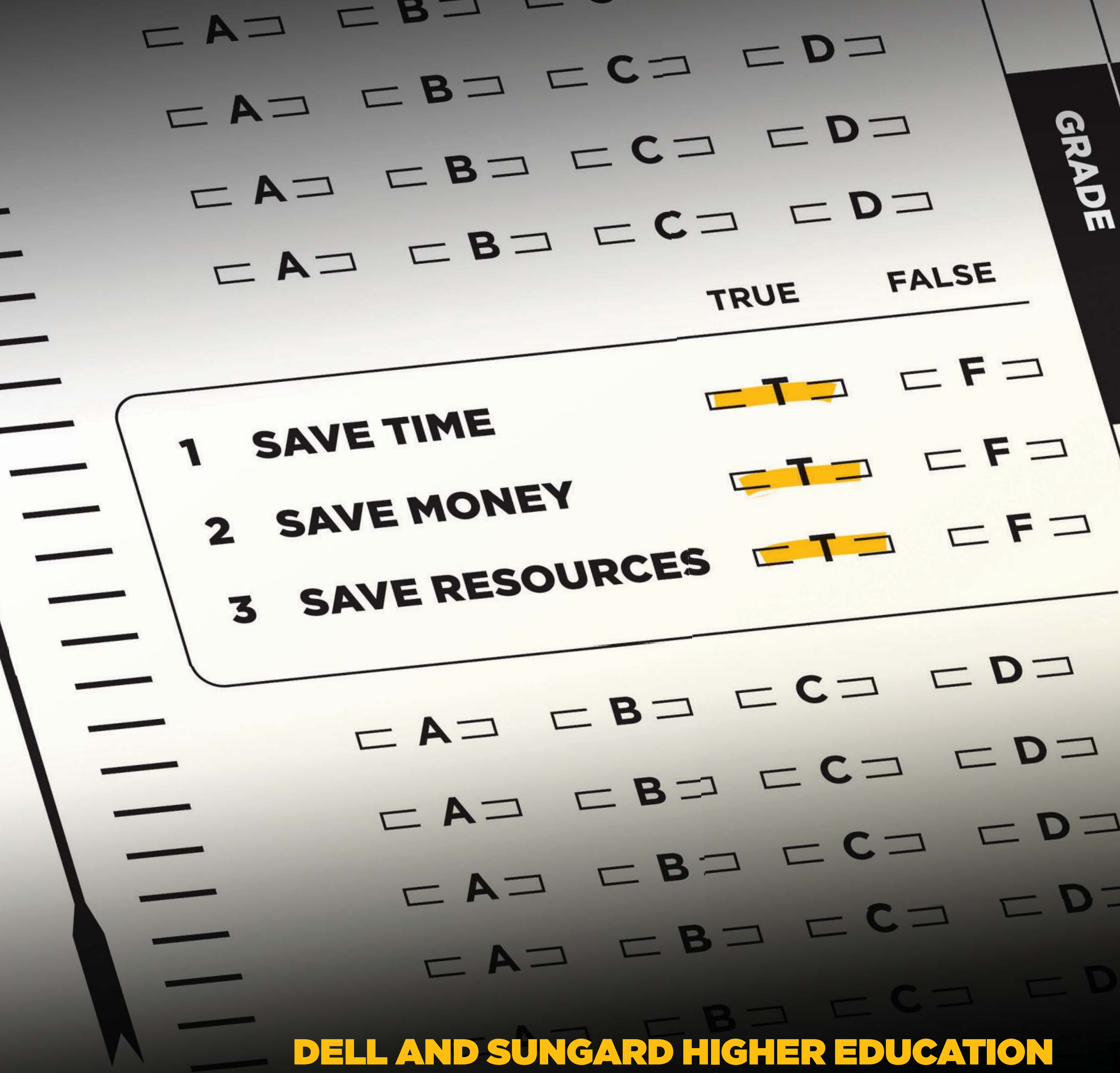
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